

REMARKS

This application was filed with 10 claims. New Claims 11 and 12 have been added. Claims 1-10 have been rejected. Claims 1-4 and 8-10 have been amended. Therefore, Claims 1-12 are pending in the Application. Reconsideration of the application based on the remaining claims as amended and arguments submitted below is respectfully requested.

Claim Rejections - 35 U.S.C. § 102(b)

Claims 1, 2, 6 and 7 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,373,111, granted to McClure et al. In response, Claims 1 and 2 have been amended to clarify the invention in a manner that clearly distinguishes it from McClure et al.

The present invention relates to the use of auxiliary conductive elements to locally increase the effective electrical cross section of electrical tracks on a circuit board, to thereby increase the effective capacity of the conductive tracks to carry electrical power. The tracks are indeed formed by one and the same metal layer. It is not possible to have thicker and thinner tracks on the same level of the board. The thickness of all the tracks on the same layer of a board is the same, irrespective of whether the tracks are intended for logic components (low power absorption) or power components (high power absorption).

On the other hand, power components may absorb high current and the tracks on which they are mounted might, therefore, require a greater cross section.

It is therefore sometimes impossible to achieve the necessary cross section of the conductive tracks, required for the power components mounted on the board.

In order to solve this problem, auxiliary conductive elements are used. The present invention relates to a novel way of designing and applying these components, namely to treat them as normal SMD components to be applied with SMD pick-and-place devices on the board.

McClure et al. is directed to bond pads, which are used to connect the (logic or power) components on the conductive tracks of the board. (See col. 1, lines 1-68 and col. 2, lines 1-60). In other words, these pads are applied on the conductive tracks of the board, in correspondence to the wires or pins of the electronic components which have to be applied on the tracks. The bond pads of McClure are not auxiliary conductive elements. An auxiliary conductive element is applied along the conductive track of the board in a position different from the position where the component(s) is (are) applied. Claim 1 has been amended to clarify that the auxiliary conductive element is bonded to the conductive track on one face of the laminar support (or board) while the electrical component is mounted on the opposite face, opposite the auxiliary conductive element. As further clarified in Claim 1 as amended, the electrical component is electrically connected to the conductive track through the board. McClure et al. does not teach such an arrangement. The bond pads in McClure et al. are bonded to the board on the same side as the electrical (SMD) components to which they correspond.

Additionally, the bond pads of McClure et al. are not adapted to (and do not have the purpose of) increasing the effective cross section of the conductive track to cope with increased power flux as required by the electronic components electrically connected to the track itself.

Therefore, Applicant respectfully submits that Claim 1 as amended is patentably distinct from McClure et al. Claims 2, 6, and 7 are dependent on Claim 1 as amended and therefore should be allowable as well.

Claims 8-10 have been rejected as being anticipated by U.S. Patent No.6,350,957 to Shingai et al. In response, Applicant has amended Claims 8-10 to clarify important differences between the present invention and Shingai et al.

The invention of Claims 8-10 is directed to a loader strip for a conventional SMD pick-and-place type machine for mounting SMD components to a laminar support. Thus, Claims 8-10 as amended include a series of adjacent recesses that removably house the auxiliary conductive elements. The strip therefore comprises a loader strip that is used by a conventional SMD pick-and-place machine for mounting SMD components. The auxiliary conductive elements can therefore be mounted to the circuit boards using efficient SMD manufacturing methods and equipment. Shingai et al. does not disclose a strip loader for an SMD mounting machine. For example, the “auxiliary conductive elements” 4 of Shingai et al. are not removably housed in the recesses such that they can be fed into an SMD mounting machine for mounting to a circuit board. Accordingly, the rejection of Claims 8-10, as amended, under 35 U.S.C. § 102(b) should be withdrawn.

Claim Rejections - 35 U.S.C. § 103

Claim 3 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over McClure et al. and Shingai et al. Claims 4 and 5 have been rejected as being unpatentable over McClure et al. in view of U.S. Patent No. 5,461,202 granted to Sera et al.

Claims 3, 4, and 5 are each dependent on Claim 1 as amended. Therefore, the remarks stated above with respect to McClure et al. as applied to amended Claim 1 are also relevant here. Neither McClure et al. nor Sera et al. disclose auxiliary conductive elements as intended and as functional according to the present invention. For example, when referring to Sera et al., the Office Action states that element 5a is an auxiliary conductive element while element 6 is an electronic component. This is incorrect in two respects. The element labeled 5a in Fig. 1(a) is a welding material, i.e., the material which electrically connects the components to the respective conductive track of the board. It is clearly not an auxiliary conductive component as defined in Claims 3, 4, and 5, as dependent on amended Claim 1.

It is also clear in Claims 3, 4, and 5 that the auxiliary conductive elements are mounted on a conductive track in a position different from (opposite) the position where the electronic components are mounted. This is not the case in Sera et al. As in McClure et al., the elements in Sera et al. which the Office Action considers as auxiliary conductive elements, are merely the connections of the electrical components to the conductive track, which is conceptually different from

an auxiliary conductive element that is functional to increase the effective power capacity of the track. Applicant respectfully submits that the rejection of Claims 3, 4, and 5 under 35 U.S.C. §103(a) should be withdrawn.

New Claims

New Claims 11 and 12 are directed to a printed circuit board having an auxiliary conductive element bonded to a conductive track with an adhesive. The auxiliary conductive element includes a void adjacent the conductive track that is at least partially filled with an adhesive. One embodiment of this arrangement is shown in Fig. 10. The prior art does not teach such an arrangement.

Applicant has commented on some of the distinctions between the cited references and the claims to facilitate a better understanding of the present invention. This discussion is not exhaustive of the facets of the invention, and Applicant hereby reserves the right to present additional distinctions as appropriate. Furthermore, while these remarks may employ shortened, more specific, or variant descriptions of some of the claim language, Applicant respectfully notes that these remarks are not to be used to create implied limitations in the claims and only the actual wording of the claims should be considered against these references.

Pursuant to 37 C.F.R. § 1.136(a), Applicant petitions the Commissioner to extend the time for responding to the December 19, 2002, Office Action for 3 months from March 19, 2003, to June 19, 2003. Applicant encloses herewith a check in the amount of \$930 made payable to the Director of the USPTO for the petition fee.

The Commissioner is authorized to charge any deficiency or credit any overpayment associated with the filing of this Response to Deposit Account 23-0035.

Respectfully submitted,



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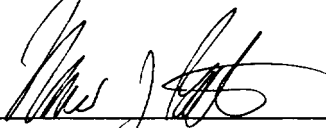
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I hereby certify that this Response and Amendment and a check in the amount of \$930.00 are being deposited with the United States Postal Service as first class mail in an envelope addressed to:

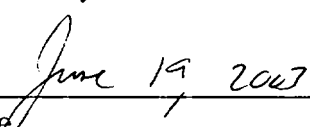
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on June 19, 2003.

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Date